

Intentions about Soil Conservation Service in the Soil Thematic Strategy of the European Commission

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1. Introduction

The instrument of soil conservation exists already some thousands of years. But the shift of economic importance from dominant agricultural use of soils to urban, industrial traffic and mining one did result in disorder of Soil Conservation objectives. Soil Conservation did not follow new trends and demands to soils. Therefore there exists today no organisation structure which bundles the concerns for soils and soil conservation. The European Commission established reports under the Thematic Strategy for Soil Protection (Hoogveld et al. 2004). One report was from the task group 'Soil and Data Property, Soil Legislative Frame Work, Soil Conservation Service'. Here are the intentions of soil conservation service presented for discussion which focus on the targets of today. They concern several aspects such as structure of applied soil science and of the fields it is active, increase of land use types in modern times, historical focus of soil conservation, and new targets of soil conservation.

2. Structure and fields of activities of applied soil science

Land is used. Land use is in most cases bound to soil quality which marks how well soil does what we want it to do (USDA-NRCS; <http://soils.usda.gov/sqi/concepts/concepts.html>). That means we have to deal with 3 different fields of activities on which land use is based. The organization structure of applied soil science will be from this :

1. Survey of soil resources and their properties, determination of soil functions and assessing soil qualities.
2. Soil conservation, that means soil use, and suitability of long time use of soils, protecting of soils and soil functions, development, establishment and restoration of soil functions by amelioration measures for lasting and improved soil quality. Examples are to keep or increase the soil volume and soil depth available for plant roots by prevention of erosion, lowering the water table by drainage, washing out of salts, cleaning soils from pollutants, and many other techniques.
3. Farmers soil management to produce returns from short time investments. Examples of short time investments on a farm scale are fertilizers, pesticides, farmers work, sowing and harvesting.

These are common structures as found for functioning of any economic branch.

3. Increase of land use types

Soil conservation is strongly linked to land use. There are some traditional types of land use such as for housing, food, wood, and other raw materials. Recently numerous additional types of land use occurred or became important. Table 1 gives an impression of this development.

Demands for diverse soil functions, to protect them, and to ameliorate soils for use increased recently drastically. Therefore soil conservation is not longer a matter of rural areas but also of urban, industrial, mining ones. For example in Europe has the coal and heavy industry belt from Katowice in Poland to the Ruhr Area in Germany to Lille in France and Birmingham in the United Kingdom undergone in the last 100 to 250 year a strong change of soil use.

4. Historical focus of Soil Conservation

Soil conservation has a long history. But it differs in his European context from the US one. In Europe it covers a much broader and complete field of land use types and soil information. Soil conservation is performed particular in large and long lasting programs. Often they result from impulses of natural, social, economic, and war disasters. Table 2 gives some examples.

In most of the programs soil conservation is only one part of the activities. Soil Conservation is often used for targets which main focus is not the soil. On the other hand it is a necessary and most important part of activities with huge financial and organisation investments.

Table 1 Examples of land use of rural and constructed environment and recent extension	
1 Rural areas - Forests - Greenland - Arable land - Housing Old	2 Urban, industrial and mining areas - Residential areas - Commercial areas - Hospitals, public buildings - Vegetable gardens - Parks Old
New - Water winning area - Rural and urban areas roads - Highways, streets, sidewalks - Car parks - Railways - Airports - Harbours - Canals - Dams - Drainage systems - Diverse pipe lines, supply lines - Green houses	New - Industrial production areas - Play grounds, diverse sport grounds - Kindergarten - School yards - Burial ground - Zoo, botanical garden - Urban forest - Sewage plants - Landfill covers; car park covers - Heaps of sludge, domestic and industrial wastes - Heaps of mining waste - Natural heritage and archaeological sites

Table 2 Historical reasons for soil conservation activities
<ul style="list-style-type: none"> - Colonization of new land, drainage of swamps, dike construction - Fighting against diseases, example malaria - Give land to refugees; example after second world war in Middle and East Europe - Give work in times of economic depression; work camps during the world economy crisis 1929-1937; USA erosion projects, Germany peat land drainage; - To reduce yearly harvest fluctuation for stabilization of farmers income - To improve state income; late middle age to modern times - To prevent population loss by emigration (Friedrich II of Prussia) - To secure food supply by lack of foreign currency for buying food from abroad (former Socialist States) - To logistic preparation of wars, Plaggen Soil establishment by the Saxons in the early Middle Age - Disarm of armies (Friedrich II of Prussia) - Installation of irrigation systems, e.g. Middle East, California, Southern France - Recently amelioration of saline soils in the Euphrates valley, Australia. Fight against salinity from irrigation without drainage, and change of landscape water balance due to deforestation - To make land available for large projects like high way and canal construction, urban and industrial extension, establishment of natural heritages, by improving farmers land value for purpose of land exchange.

5. New targets of Soil Conservation

Most of the targets listed in table 2 are still existing. We have large population movement not only by refugees but also from rural to urban areas. From the loss of population in rural areas and concentration in large cities, changes in human life and large dimensions of mining and industrial activities, of infrastructure and traffic projects occur new demands and threads for soils but also hazards from soils. Table 3 gives some example for this. Some are more local(lo) problems like erosion or pollution. Others concern large areas(la) such as draughts or floods. Therefore soil conservation services must be actives on different scales: local, regional, nation and several countries wide. We must be also aware that we in Europe, the US, and more and more people from other regions consume high amounts of products from all over the world. Sustainable supply with goods from international markets makes soil conservation no longer to a local task.

Soil conservation service has the target to ameliorate the quality of life and the cost of it. They concerns not only soil use for farming and products from farms. The highest are today the health and social constrains and

costs. They are the big challenges. Heat in cities with ten thousand elder people dead, and hundred thousand going to

Table 3 Modern time reasons for soil conservation activities	
<ul style="list-style-type: none"> - Food supply for people of low income in large cities by urban agriculture and allotments - Prevent land slide in city dwellers area (lo) - Establish an green environment in cities for an aging population of reduced mobility (lo) - Mitigating loss of large areas of soils and their functions by excavation and sealing (lo). - Use of soils underneath sealed areas; by trees, for storm water infiltration (lo) - Remediation of soils from technological, landfill and mining materials, from wastes (lo) - Remediation of polluted, eutrophicated and compacted soils (lo) - Urban soils as sources of pathogenic micro-organisms, dust (lo). - Erosion from road construction in hilly areas (lo) - Floods due to loss of water storage and infiltration capacity of soils by soil compaction and biological soil activity reduction. (la) - Establish sewage canals and sewage plant systems (la) - Overheating due to sealing and low water storage capacity of soils, and large area climate events like strong storm and rainfall (la) - Increase of soil carbon content for carbon sequestration, and other benefits (la) - Make land available for sustainable recreation, holidays, retirement homes (la) - Support initiatives to introduce new crops for example for energy production (lo-la). - With expected increase of land shortage for crop production make available more land and increase productivity by amelioration measures (la). 	

hospital is one of the problems nowadays. The poor people cause the highest social costs. They are living in areas of sealed or by wastes spoiled soils. Also according to this they will have more diseases and social problems. There are many examples of the effect of absence of vegetation which increases danger from landslide and dust in urban areas. Decrease of children mental development and intelligence by high lead uptake is another result of urbanisation. The decomposition of organic waste is an important contribution to urban hygiene. These examples show that reduction of problems of soils and their use to an environmental problem does not meet the reality.

6. Soil services and common land use

Land use occurred over the centuries as a collective or as individual operation. Many of modern types of soil uses are not linked to the targets of an ownership of land. They are essential community services. Beside this to the primary land use joins second and more levels of land uses. Table 4 gives some examples. The responsibility of soil conservation for common services is already practiced example for wild life protection in the US.

Table 4 Land use by community and individual properties	
<p>Historical-----</p> <p>Recent-----</p>	<p>--Community used land</p> <p>--Individual used land</p> <p>--Community services from land: clean air, water, protection against erosion and floods, heat mitigation, carbon sequestration</p> <p>--Second and third level of land use: recreation, habitats, nice view</p>

7. Responses by soil conservation measures on impacts and research necessity

Soil conservation performance is based on different measures. It provides techniques on different fields, such as regulations, planning, measures to achieve soil protection and soil improvement. Table 5 gives an oversight for modern fields of impacts. Before establishment of a European Soil Conservation structure and service research must assess the current state of soil conservation work and what is left from former organisation structures in the European countries. Table 6 contains some of the research questions.

8. Conclusions

The reduction of soil conservation service to an environmental service with concern on farm problems, erosion and industrial pollution does meet only in part the real needs. Soil uses got more manifold in modern

times; particular in urban areas. Demands for quality of life of more and more people, and their costs are linked to socio-economy and health. Soil conservation service contributes to a wide field which has to be developed by politics, administration and research. It will be effectively organized as an independent and responsible service

Table 5 Measures against modern impacts such as

- remediation of polluted soils, abandoned and derelict sites (brown fields)
- preventing sealing and mitigating sealing effects
- preventing wind and water erosion in other than farm land
- prevention of organic substance decrease in other than farmland
- managing climatic effects of carbon dioxide release and albedo by land use and soil moisture content
- preventing and amelioration of soil compaction, enable storm water infiltration and soil aeration
- preventing ground water pollution and decrease of ground water renewal
- protection and managing biodiversity, also of locations of extreme soil properties (e.g. of high pollution, stoniness, sealed)
- sustainable soil cover of land fills, cover of contaminated sites
- sustainable use, deposition or destruction of communal and industrial sludge
- conservation measures for sustainable play grounds, school yards
- conservation measures for sustainable tourism
- conservation measures for sustainable soil use as recreation areas, sporting areas (horse riding, golf, skiing, trekking, camping, hunting)
- remediation of mining, industrial areas, also pipe line and traffic accident areas
- de-sealing and remediation of de-sealed soils
- remediation of soils affected by construction residues
- preservation of soil filter, transfer, conversion and decomposition functions
- amelioration of acidified soils
- remediation of eutrophicated, by pesticides polluted soils, of soils containing pathogenic organisms
- prevention and remediation of drug polluted soils
- improving burial grounds
- protection of soils for habitats
- peat and wetland protection, renaturation of wet lands, marshes, river plains, peat lands, dry lands
- soil protection of abandoned rural, urban and industrial sites
- establishing permanent green soil cover, also in cities
- forestation of abandoned and degraded sites
- mitigating and amelioration of soil degradation by military use.

Table 6 Research for or as a first step of the establishment of a European Soil Conservation Service.

- existing state and regional organizations in the European Union which are concerned with the objectives of soil conservation service; their structure, main focus and capacities, and which region they cover and support,
- existing state and regional organizations in the European Union which are concerned with the objectives of soil monitoring service; their structure, main focus and capacities, and which region they cover and support,
- objectives of soil conservation services of different regions of Europe which are already well established and those objectives and regions which are not, covered by administration, management, improvement measures and research,
- the demand on structure, objectives and capacities for a European Soil Conservation Service,
- contributions of soil conservation service for local, regional and European Union wide soil protection, soil improvement and soil use, and in general quality of life,
- research structure for a successful European Soil Conservation,
- fields of institutes attached to soil conservation service.

8. References

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